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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/893,971	06/29/2001	Mi Sook Nam	8733.480.00	6136

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1900 K STREET, NW  
WASHINGTON, DC 20006

EXAMINER
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NGO, HUYEN LE

ART UNIT	PAPER NUMBER
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2871

DATE MAILED: 05/08/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/893,971

Applicant(s)

NAM ET AL.

Examiner

Julie-Huyen L. Ngo

Art Unit

2871

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-36 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-36 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

**DETAILED ACTION**

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 3, 6-10, 15-18, 22, 26-30 and 35-36 are rejected under 35 U.S.C. 102(b) as being anticipated by Miyazaki et al. (US5978061A).

Miyazaki et al. teach (Figs. 9-10) a method for fabricating a liquid crystal display (LCD) comprising:

- forming a first substrate 11 and a second substrate 31;
- forming patterned spacers 38 on the first substrate;
- forming oriented films 21/35 on the first substrate and on the second substrate;
- disposing the first substrate and the second substrate in a facing relationship wherein the oriented films on the first substrate and on the second substrate contact each other;
- performing an orientation treatment on the oriented films on the first substrate and on the second substrate such that the oriented films bond the first substrate and the second substrate together (col. 8 lines 22-27);
- interposing a liquid crystal 40 between the first substrate and the second substrate.

wherein

- performing the orientation treatment includes performing light radiation on the oriented films (claims 3 and 13).

**DETAILED ACTION**

***Claim Rejections - 35 USC § 102***

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- performing an orientation treatment on the oriented films on the first substrate and on the second substrate such that the oriented films bond the first substrate and the second substrate together (col. 8 lines 22-27);
- interposing a liquid crystal 40 between the first substrate and the second substrate.

wherein

- performing the orientation treatment includes performing light radiation on the oriented films (claims 3 and 13).

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- the light radiation is performed with UV light (claim 6).
- performing the orientation treatment includes pressing the first substrate and the second substrate together (claims 7 and 13).
- forming a first substrate includes:
  - forming a plurality of crossing gate lines and data lines on the first substrate;
  - forming thin film transistors at each crossing;
  - forming pixel electrodes that electrically connect to the thin film transistors.
- the patterned spacers are formed between the pixel electrodes (claims 9 and 28).
- the spacers are located by depositing and then patterning a spacer material (claim 17).
- the spacers are located by dispersing photo cross-linkable adhesive spacers on the first substrate (claims 18 and 30).
- the light reactive materials on the first substrate and on the second substrate react to UV light (claims 26 and 35).
- the light reactive materials on the first substrate and on the second substrate are of a photosensitive polyimide lineage (claims 27 and 36).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2, 12, 23 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyazaki et al. (US5978061A) as applied claims 1, 3, 6-10, 15-18, 22, 26-30 and 35-36 above, in view of Gass et al. (US5808716A).

Gass et al. teach utilizing a smectic liquid crystal for enhancing resistance to mechanical damage (col. 7 line 64-65).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify a liquid crystal display (LCD) as Miyazaki et al. disclosed utilizing a smectic liquid crystal for enhancing resistance to mechanical damage.

Claims 4, 14, 20, 24 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyazaki et al. (US5978061A) as applied claims 1, 3, 6-10, 15-18, 22, 26-30 and 35-36 above, in view of Takuma et al. (US4734218A).

Takuma et al. teach performed an alignment with linearly polarized light for ensuring homogeneous orientation (col. 11 lines 65-68).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify a liquid crystal display (LCD) as Miyazaki et al. disclosed with the alignment performed with linearly polarized light for ensuring homogeneous orientation.

Claims 5, 21, 25 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyazaki et al. (US5978061A) as applied claims 1, 3, 6-10, 15-18, 22, 26-30 and 35-36 above, in view of Bryan-Brown et al. (US5724113A).

Bryan-Brown et al. teach performing an alignment with elliptically polarized light for reducing ordering along the x direction (col. 5 lines 12-21).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify a liquid crystal display (LCD) as Miyazaki et al. disclosed with an alignment performed with elliptically polarized light for reducing ordering along the x direction.

Claims 11, 19 and 31 rejected under 35 U.S.C. 103(a) as being unpatentable over Miyazaki et al. (US5978061A) as applied claims 1, 3, 6-10, 15-18, 22, 26-30 and 35-36 above, in view of Yamagishi et al. (US5729312A).

Yamagishi et al. teach forming spacers including photo cross-linkable adhesive spacers and ball spacers (spherical adhesive spacers) for expelling out of the liquid crystal regions being affected by the surface tension of the liquid crystal during the phase separation of the liquid crystal and the polymers, so that the substrate gap control materials may be introduced into the polymer walls (col. 26 lines 30-38).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify a liquid crystal display (LCD) as Miyazaki et al. disclosed with spacers including photo cross-linkable adhesive spacers and ball spacers (spherical adhesive spacers) for expelling out of the liquid crystal regions being affected by the surface tension of the liquid crystal during the phase separation of the liquid crystal and the polymers, so that the substrate gap control materials may be introduced into the polymer walls.

***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

Wenz (US5545280) discloses a method of selectively applying adhesive to protrusions on a substrate.

Tamai et al. (US5880803A) disclose a liquid crystal display element with a portion of an alignment layer covers spacer is directly bonded to the alignment layer on the other substrate.

Endou et al. (US6063829A) disclose a treating method for liquid crystal alignment, which comprises applying polarized ultraviolet or electron rays to a polymer thin film formed on a substrate, in a predetermined direction relative to the substrate surface, and using the substrate to align liquid crystal without rubbing treatment.

***Contact Information***

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Julie Ngo, whose telephone number is (703) 305-3508.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist, whose telephone number is (703) 308-0956.

Papers related to this application may be submitted to Art Unit 2871 by facsimile transmission. The Examiner direct fax number is (703) 746-4709. Please call before sending any paper.

May 2, 2003

*Julie Huyen L. Ngo*  
**Patent Examiner**  
**Art Unit 2871**